

## Display system with a stationary supporting base

The invention relates to a display system including a stationary supporting base and a display device, such as a television set or a monitor, supported by the supporting base.

Such a system is generally known, the supporting base being formed by a table, a cupboard, a stand, a supporting arm fixed to a wall or a ceiling, or another support. The display device is provided with a display screen. In such a system the display device has a fixed position as to location and orientation relative to a viewer viewing the display screen.

In many cases the permanent adjustment of the location and the orientation of the display device, particularly its screen, is not convenient to the viewer. In some cases the supporting base is provided with mechanical means, such as screws, to change the position of the display device into another position. However, this way of adjusting is quite cumbersome.

An object of the invention is to improve the known display system such that its position can be changed in a simple and accurate way. This object is achieved in the display system according to the invention, which system includes a stationary base, a display device movably supported by the supporting base and an electromagnetic positioning unit for positioning the display device relative to the supporting base. By the presence of the electromagnetic positioning unit the opportunity offers to adjust the position of the display device, and thus of the display screen, at each moment wished by a viewer. Due to the fact that the display device is movably arranged, i.e. movably beared, with respect to the supporting base the display device can be moved, such as rotated, tilted and/or shifted, relative to the supporting base under the influence of magnetic forces generated by the electromagnetic positioning unit when this unit is energized. It is favorable to provide the system with a remote control function for controlling the electromagnetic positioning unit. This remote control function may be incorporated in the remote control, known per se, being usually apart of a display system, but may of course be a separate remote control. In order to lock the display device in a desired position obtained after adjustment by means of the positioning unit, it is favorable to provide the display system with a locking unit, particularly a locking unit comprising a solenoid. It is convenient to control the locking unit by means of the remote control. The display device of the system according to the invention may be a

monitor or television set of a conventional kind or of a more modern kind in which case the conventional picture tube has been replaced by a more sophisticated display unit, such as a LCD.

5 In a practical embodiment of the display system according to the invention the supporting base is provided with a rod-shaped guide for guiding the display device. During use the guide will usually extend in a horizontal or a vertical direction, but also other directions may be suitable. The guide may be straight or curved dependent on the application.

10 In a further practical embodiment of the display system according to the invention the electromagnetic positioning unit includes a translation actuator for translating the display device along the rod-shaped guide and/or a rotation actuator for rotating the display device round the rod-shaped guide. Preferably well-known actuator devices are used for realizing the desired movements of the display device. This makes the inventive display system simple and efficient, and thus an attractive positioning unit is obtained. The obtainable translational and rotational movements are in general sufficient to find a suitable position, i.e. a location and an orientation, of the display device, and thus of its display screen, with regard to the viewer.

20 The actuators may be designed as is defined in the Claims 4 and 5, but also other systems of magnets and coils are possible. If needed for actuating, the rod-shaped guide may be made of a magnetic material. It is also possible to make use of an actuator unit which is such designed that it can perform both desired movements.

Further embodiments of the display system according to the invention are described in the Claims 6 to 9.

With reference to the Claims, it is to be noted that various characteristic features as defined in the set of Claims may occur in combination.

25 The above-mentioned and other aspects of the invention are apparent from and will be elucidated, by means of non-limitative example, with reference to embodiments described hereinafter.

In the drawings:

30 Figure 1 schematically illustrates in a perspective view the general structure of the display system according to the invention, and

Figure 2 schematically illustrates embodiments of the actuators applied in the display system according to the invention.

The display system according to the invention as disclosed in the Figure 1 has a stationary supporting base 1 and a display device 3 movably supported by the supporting base. The display device 3, which has a screen 3a, is in this example an LCD TV set. Such a set is lighter in weight compared to CRT TV sets or Plasma TV sets. The supporting base 1 includes a rod-shaped guide 5 serving as a guiding and mounting body for the display device 3. In this example, the guide 5 is fixed to a socle 6. The display system according to the invention further has an electromagnetic positioning unit 7 serving as a drive for the display device 3. The display system includes a first actuator being a translation actuator for moving the display device along the guide and a second actuator being a rotation actuator for moving the display device round the guide. Both actuators may be known actuator devices. The invention does not relate to the actuator as such. The movements along and round the guide 5 are indicated by the arrows T and R, respectively.

Both actuators are positioned or at least partly positioned in a housing 8 attached to the display screen 3a. It is also possible to make use of a housing 8 in which the screen 3a is integrated.

The housing 8 may be provided at both axial ends with a sleeve, wherein the sleeves serve for sliding and stability. Instead of sleeves, sliding bearings may be used.

In order to lock the display device 3 in a reached and/or desired position the display system is provided with a locking device 9, which in this example includes a solenoid known per se.

Although not shown in the drawings, the shown example of the display system according to the invention includes a remote control for controlling the positioning unit 2 and the locking device 9. In such remote control well known control circuitry may be applied.

In Figure 2 an embodiment of the first actuator, indicated by the numeral 7t, and an embodiment of the second actuator, indicated by the numeral 7r, of the electromagnetic positioning unit 7 are disclosed. The first actuator 7t comprises a permanent-magnet section 7t1 attached to the rod-shaped guide 5 and a coil section 7t2 secured to the display device 3 and placed in the magnetic field of the permanent-magnet section 7t1. By energizing the coil section 7t2 axial forces are generated for translating the display device 3 along the guide 5. The second actuator 7r comprises a permanent-magnetic part 7r1 fixed to the display device 3 and a coil part 7r2 secured to the rod-shaped guide 5 and placed in the magnetic field of the permanent-magnetic part 7r1. By energizing the coil part 7r2 tangential forces are generated for rotating the display device 3 round the guide 5. In this way the

displacements of the display device are obtained in a controlled way and are performed in a noiseless manner.

It is expressly noted that the invention is not limited to the embodiments shown herein. For example, various available actuator devices may be used.

## CLAIMS:

1. A display system including a stationary supporting base, a display device movably supported by the supporting base and an electromagnetic positioning unit for positioning the display device relative to the supporting base.
- 5 2. A display system as claimed in Claim 1, wherein the supporting base is provided with a rod-shaped guide for guiding the display device.
3. A display system as claimed in Claim 2, wherein the electromagnetic positioning unit includes a translation actuator for translating the display device along the  
10 rod-shaped guide and/or a rotation actuator for rotating the display device round the rod-shaped guide.
4. A display system as claimed in Claim 3, wherein the translation actuator includes a permanent-magnetic section formed in or on the rod-shaped guide and a coil  
15 section secured to the display device and disposed in the magnetic field of the permanent-magnetic section.
5. A display system as claimed in Claim 3, wherein the rotation actuator includes a permanent-magnetic part formed in or on the display device and a coil part fixed to the rod-  
20 shaped guide and disposed in the magnetic field of the permanent-magnetic part.
6. A display system as claimed in any one of the Claims 1 to 5, wherein the system is provided with a locking device for locking the display device in a position.
- 25 7. A display system as claimed in Claim 6, wherein the locking device includes a solenoid.
8. A display system as claimed in any one of the Claims 1 to 5, wherein the system includes a remote control for controlling the positioning of the display device.

9. A display device as claimed in Claim 6 or 7, wherein the display system includes a remote control for controlling the locking of the display device.

## ABSTRACT:

The invention relates to a display system which includes a stationary supporting base 1, a movably supported display device 3 and an electromagnetic positioning unit 7. By means of this positioning unit the location and the orientation of the display device can be adjusted in compliance with a viewer's wish.

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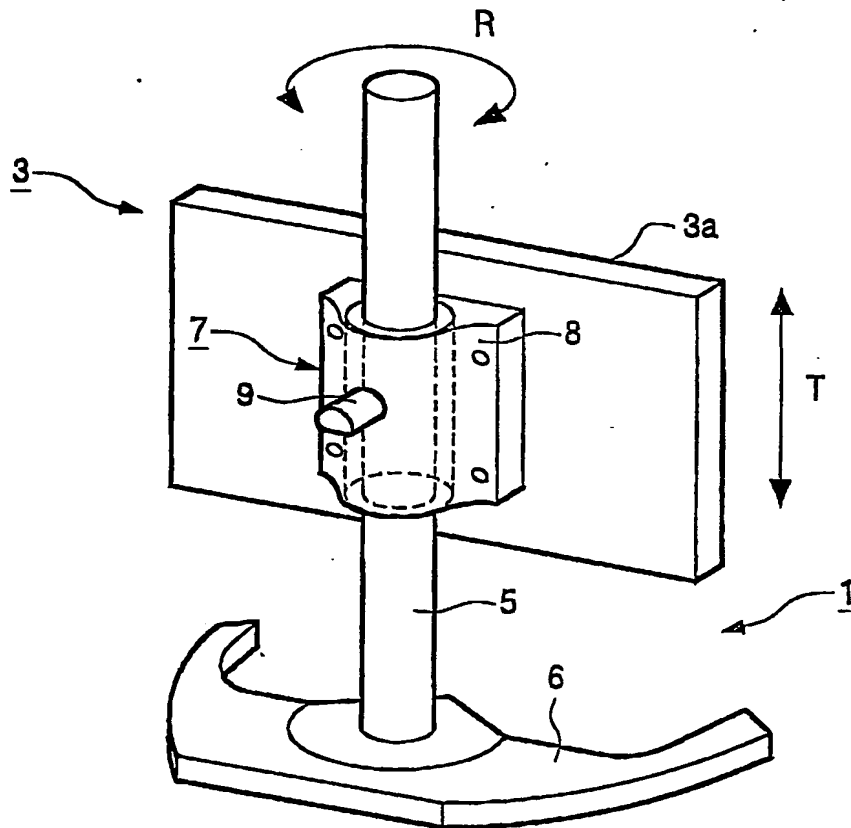


Fig.1



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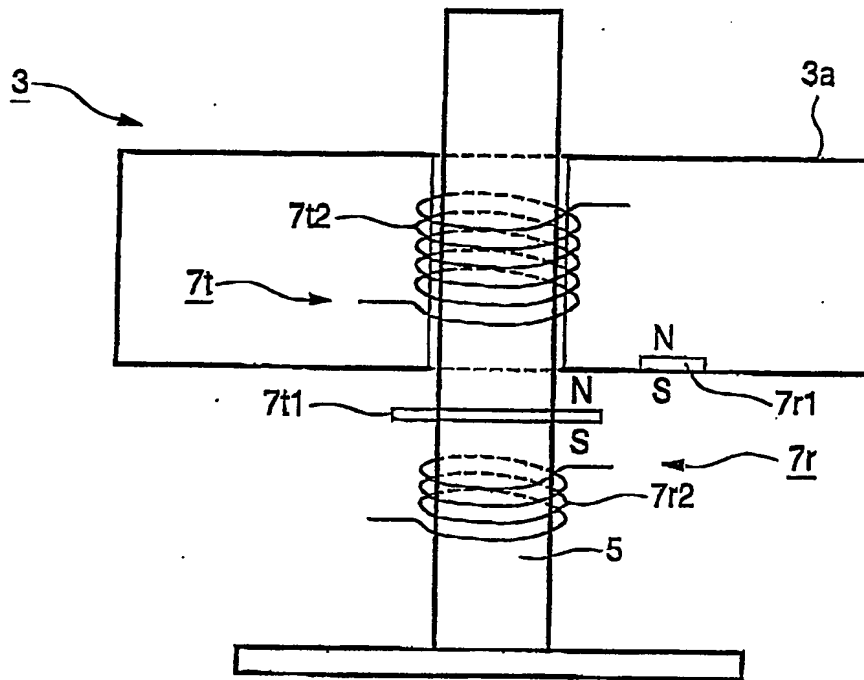


Fig.2

# INTERNATIONAL SEARCH REPORT

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<b>A. CLASSIFICATION OF SUBJECT MATTER</b> IPC 7 F16M11/24 F16M11/18 F16M11/08		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) IPC 7 F16M G06F G09F H04N		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the International search (name of data base and, where practical, search terms used) WPI Data, PAJ, EPO-Internal		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 00 73697 A (RASMUSSEN SOEREN ;SOEREN RASMUSSEN IND DESIGN AP (DK)) 7 December 2000 (2000-12-07) page 2, line 12 -page 3, line 19 page 5, line 16 -page 6, line 6 page 7, line 14 - line 25; figure 1 ---	1-3,8
X	GB 2 370 171 A (SESAY NED KANDEH) 19 June 2002 (2002-06-19) the whole document ---	1,8
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X	US 6 352 226 B1 (GORDON SETH A) 5 March 2002 (2002-03-05) column 3, line 44 - line 51; figures 1-2A --- -/--	1,6,7
<div style="display: flex; justify-content: space-between;"> <span><input checked="" type="checkbox"/> Further documents are listed in the continuation of box C.</span> <span><input checked="" type="checkbox"/> Patent family members are listed in annex.</span> </div>		
<div style="display: flex;"> <div style="flex: 1;"> <p>* Special categories of cited documents:</p> <p>*A* document defining the general state of the art which is not considered to be of particular relevance</p> <p>*E* earlier document but published on or after the International filing date</p> <p>*L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>*O* document referring to an oral disclosure, use, exhibition or other means</p> <p>*P* document published prior to the International filing date but later than the priority date claimed</p> </div> <div style="flex: 1;"> <p>*T* later document published after the International filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>*Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>*Z* document member of the same patent family</p> </div> </div>		
Date of the actual completion of the International search  <div style="text-align: center; font-weight: bold;">27 January 2004</div>		Date of mailing of the International search report  <div style="text-align: center; font-weight: bold;">03/02/2004</div>
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax (+31-70) 340-3016		Authorized officer  <div style="text-align: center; font-weight: bold;">Baron, C</div>

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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